

# Contribution to the study of the Phycitinae (Pyralidae, Lep.). Part IV\*

by

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Genus **ECCOPIDIA** Hmps. (Fig. 55).

*Eccopidia* Hmps., Journ. Bomb. N. H. Soc. XII. p. 311 (1899); Rag. Rom. Mém. Lep. VIII. p. 87 (1901).

Type: *Eccopidia strigata* Hmps., from Ceylon.

♂, ♀. Proboscis strongly developed, scaly at base; labial palpi slender, upcurved, reaching well above vertex; first joint half of second joint; 3rd joint a little shorter than second and tapering to a point; maxillary palpi short, appressed to frons, covered and tufted at tip with long scales, imperfectly three jointed as first and second joints are somewhat fused, terminal joint a little shorter than these two combined; frons smooth; ocelli present; antennae simple in ♀ (unfortunately my ♂ has lost the antennae and only ♀♀ have been described by other workers). *Forewing*: smooth on upperside, narrow, of almost even width, length four times greatest width; costa straight for two-thirds, then arched into rounded apex; termen oblique and arched; inner margin straight for terminal two-thirds; cell almost two-thirds of wing;  $R_1$  from beyond two-thirds of upper median and obsolescent near costa;  $R_2$  remote from and parallel to stalk and  $R_3$ ;  $R_3$  and  $R_4$  stalked till beyond middle of  $R_3$ ;  $M_1$  as far from stalk as  $R_2$  is; DC between  $M_1$  and  $M_2$  obsolescent;  $M_2$  twice as far from  $M_1$  as  $M_1$  is from stalk and slightly approximated to  $C_1$  at base;  $M_3$  coincident with  $M_2$ ;  $C_2$  a little further from  $C_1$  than  $C_1$  is from  $M_2$ ;  $A_2$  almost straight;  $A_1$  obsolescent. *Hindwing*: subtrapezoidal, width over half of length; costa slightly arched; apex hardly rounded, termen very oblique and strongly arched between  $M_2$  and  $A_3$ , tornus well rounded, inner margin a little incurved at base; cell almost one-third of wing; DC obsolescent at upper half and incurved, lower half more oblique outwardly; RS running along Sc for over half its length but nowhere fusing with it; most of upper median obsolescent;  $M_1$  very shortly stalked with RS;  $M_2$  and  $M_3$  coincident and stalked with  $C_1$  for half its length;  $C_1$  from four-fifths of lower median; A veins radiating and nearly straight.

\* Part I was published in vol. IV of this "Journal", pp. 134—166 (1941); part II in vol. V., pp. 27—45 (1942); part III in vol. VII., pp. 1—16 (1944). No regular order is followed but genera are dealt with as sufficient study material becomes available.

This genus contains so far two species, both from Ceylon. My ♂ of the genotype was kindly compared with the type for me by Mr. W. Tams. The forewing markings of this species are very characteristic. The other species, *vinistis* Hmps., is not known to me from specimens.

Genus **UNADILLA** Hulst. (Fig. 56).

*Unadilla* Hulst, Tr. Am. Ent. Soc. XVII. p. 197 (1890); Rag. Rom. Mém. Lep., VIII., p. 261 (1901).

Type: *Homoeosoma erronella* Zell., from N. America.

♂, ♀. Proboscis strongly developed, covered with scales at base; labial palpi upcurved, reaching a little above vertex in ♂, more so in ♀, smoothly covered with scales and tapering to a point; basal joint about half of second joint; terminal joint a little over half of second in ♂, longer in ♀ and slightly tapering to a blunt point; maxillary palpi appressed to frons, imperfectly three-jointed as basal joints are partly fused; terminal joint as large as the two other joints together and at an angle to it, suboval and terminally tufted with scales; frons smoothly scaled; chaetosema present in ♂; ♀ antenna shortly ciliated, simple in ♀, basal joint broad and large. *Forewing*: smooth above, narrow, broadest at tornus; costa almost straight, curved towards apex, which is broadly rounded; termen oblique and well arched into rounded tornus; inner margin almost straight; cell nearly two-thirds of wing; Sc and R<sub>1</sub> obsolescent near costa; R<sub>1</sub> from beyond two-thirds of upper median; R<sub>2</sub> well remote from angle; R<sub>3</sub> and R<sub>4</sub> coincident; M<sub>1</sub> half the distance from the angle than R<sub>2</sub> is; M<sub>2</sub> and M<sub>3</sub> coincident and as far from M<sub>1</sub> as M<sub>1</sub> is from R<sub>2</sub>, DC between them obsolescent; C<sub>1</sub> from middle of M<sub>3</sub> and C<sub>2</sub>; A<sub>2</sub> straight; no trace of A<sub>1</sub>. *Hindwing*: sub-trapezoidal, width less than half its length; costa straight, curved into rounded apex; termen very oblique, slightly incurved below apex, then curved into broadly rounded tornus, inner margin almost straight, incurved at base; cell one-third of wing, DC obsolescent; RS fused with Sc to near tip of Sc; upper median obsolescent for basal two-thirds; M<sub>1</sub> from angle; M<sub>2</sub> and M<sub>3</sub> coincident; C<sub>1</sub> a little remote from M<sub>2</sub>; C<sub>2</sub> from three-fourths of lower median; anal veins almost straight, radiating.

One of the two specimens used for the description was identified by Hampson and again compared by Tams; the other was identified by Schaus.

Apart from the genotype, eight other species have been recorded, four from Australia, two from Hawaii and two from the Bahamas.

Genus **PLODIA** Guen. (Fig. 57).

*Plodia* Guenée, Ind. meth. p. 80 (1845); Rag., Rom. Mém. VIII., p. 305 (1901); Spuler, Eur. Schmett. II, p. 201 (1910).

Type: *Tinea interpunctella* Hübn., from Europe.

♂, ♀. Proboscis strongly developed, scaly at base; labial palpi with second joint obliquely upturned, just reaching vertex; second joint porrect, all joints smoothly covered with scales; basal joint less than half of second joint; third joint smaller still; maxillary palpi small, appressed to frons, covered and terminally tufted with long scales, two-jointed, joints of even length; frons tufted with scales; vertex smoothly scaled; ocelli and chaetosema absent; ♂ antennae very shortly ciliated; simple in ♀; thorax, abdomen and legs smoothly scaled. *Forewing*: smooth on upperside, narrow, broadening towards two-thirds costa, slightly arched at terminal half, apex broadly rounded, termen oblique and arched into broadly rounded tornus; cell two-thirds of wing;  $R_1$  from two-thirds of uppermedian, obsolescent near costa, and so are Sc and  $R_2$ ;  $R_2$  from three-fourth distance between  $R_1$  and upper angle;  $R_3$  and  $R_4$  coincident and from upper angle;  $M_1$  a little closer to  $R_3$  than  $R_2$  is; DC between  $M_1$  and  $M_2$  obsolescent and outwardly oblique;  $M_2$  and  $M_3$  coincident;  $C_1$  remote from  $M_2$ ;  $C_2$  twice as far from  $C_1$  as  $C_1$  is from  $M_2$ ;  $A_2$  simple, straight. *Hindwing*: trapezoidal, width a little less than half its length; costa straight, arched towards rounded apex; termen oblique, straight, arching into rounded tornus; inner margin roundly bulging at  $A_1$  but almost straight before and beyond  $A_1$ , cell less than half of wing, DC erect, incurved, thin, but clearly visible; Sc strongly anastomosing with RS till near tip; RS very shortly stalked with  $M_1$ ;  $M_2$  and  $M_3$  coincident and slightly approximated to  $C_1$  at base;  $C_2$  from three-fourths of lower median; anal veins radiating, straight.

The genotype has a very large distribution and may be expected from all parts of the world where meal, flour and preserved fruits are imported, as the larvae feed on this, often in great numbers. It is doubtful what the original home may have been, but judging from its distribution it may be the Mediterranean region. One other species has been described in this genus from China.

Genus **HOMOEOSOMA** Curt. (Fig. 58).

*Homoeosoma* Curt., Ent. Mag., I, p. 190 (1833); Hmps., Moths of India, vol. IV., p. 66 (1896); Rag., Rom. Mém. VIII., p. 227, pl. I., fig. 41, pl. II., fig. 18 (1901).

Type: *Tinea sinuella* Fabr., from Europe.

♂, ♀. Proboscis strongly developed, covered with scales on basal portion; labial palpi curved, upturned, reaching well above

vertex, smoothly covered with scales and with a slight tuft at end of second joint; first joint less than half of second joint; third joint almost as long as second joint but much more slender; maxillary palpi minute, one-jointed (at least no other joint could be found by me), appressed to frons, tufted with scales; frons tufted with scales; ocelli absent; chaetosema present; ♂ antennae very shortly ciliated and with a small notch just above basal joint, in ♀ simple; thorax, abdomen and legs smoothly covered with scales. *Forewing*: smoothly scaled on upperside, rather narrow, three and a half times longer than greatest width, slightly tapering towards tornus; costa straight for two thirds, then arched towards somewhat rounded apex; termen oblique, straight, tornus well rounded; cell less than two-thirds of wing; DC erect, obsolescent between  $M_1$  and stalk of  $M_2$ ,  $M_3$ ; Sc,  $R_1$  and  $R_2$  obsolescent near costa;  $R_1$  from before three-fourths of upper median;  $R_2$  from one sixth origin of  $R_1$  and upper angle;  $R_3$  and  $R_4$  coincident;  $M_1$  as far from upper angle as  $R_2$  is;  $M_2$  and  $M_3$  on a stalk of nearly half of  $M_3$  or even longer;  $C_1$  as far from stalk as  $M_1$  is from  $R_2$ ;  $C_2$  as far from stalk as  $M_1$  is from  $R_3$ ;  $C_2$  a little further away;  $A_2$  almost straight; traces of  $A_1$  at basal third of wing. *Hindwing*: trapezoidal, width over half length of wing; costa straight, gradually curving into rounded apex, termen very oblique, straight, curving into well-rounded tornus; inner margin almost straight between  $A_3$  and  $A_1$ , forming a rounded bulge at  $A_1$ , then almost straight to base; cell less than two-fifths of wing; DC erect, slightly incurved, obsolescent; RS anastomosing with Sc to near tip of Sc;  $M_1$  very shortly stalked with RS;  $M_2$  and  $M_3$  coincident and slightly approximated to  $C_1$  at base;  $C_2$  from three-fourths of lower median; anal veins radiating and almost straight.

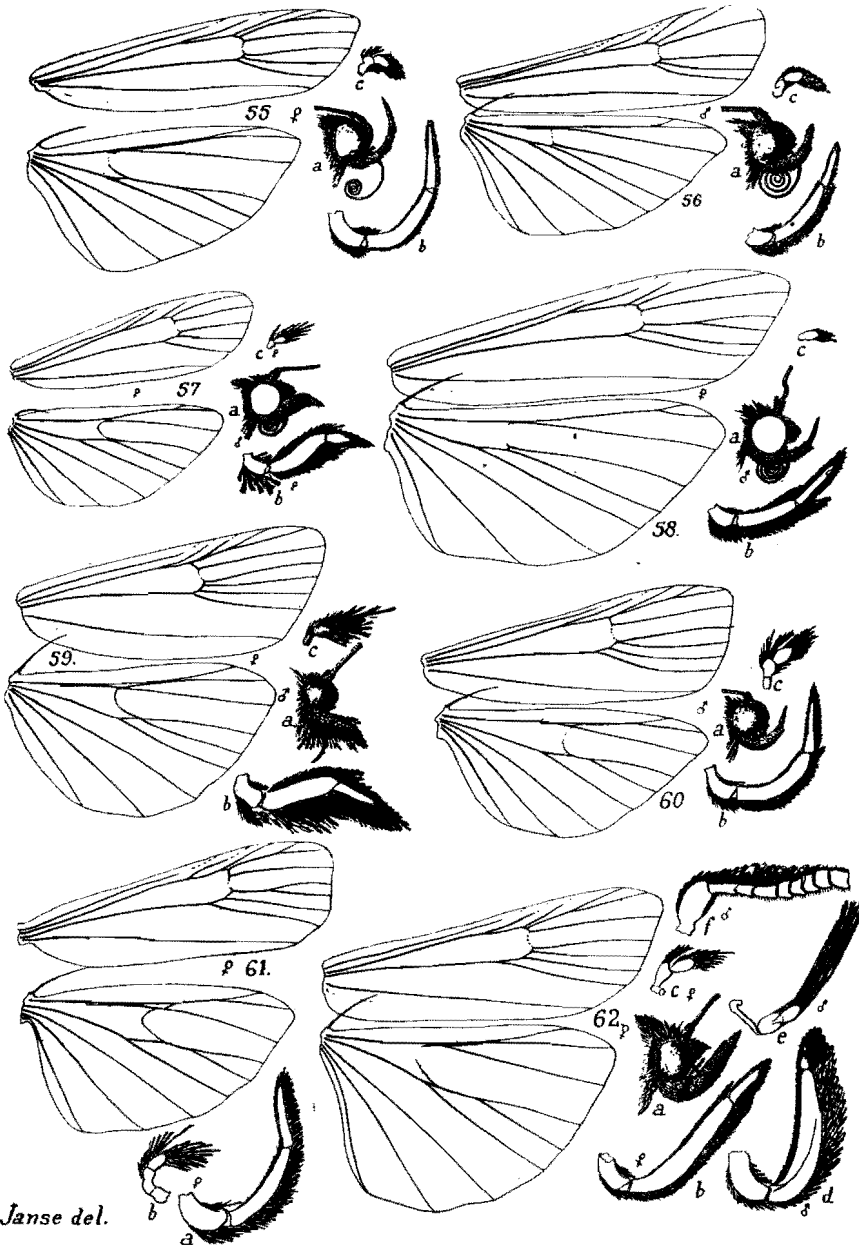
A photographic copy of a drawing of the venation, kindly sent to me by Dr. Heinrich and also made of the genotype, is identical to mine except that the stalk of  $M_2$  and  $M_3$  is a little longer in his figure than in mine. More than 90 species are placed in this genus, distributed all over the world, but it may be that a thorough study of the ♂ genitalia of these species will demand a splitting up into subgenera or even genera.

Genus **ASARTA** Zell. (Fig. 59).

*Asarta* Zell., Isis, p. 686 (1848); Rag., Rom. Mém., VIII., p. 1, pl. II., 16 (1901).

Type: *Phycis aethiopella* Dup., from Europe.

♂, ♀. Proboscis strongly developed and covered with scales at base; labial palpi rostriform, often somewhat drooping, loosely covered with long scales and somewhat fringed with long narrow scales below; length over twice greatest diameter of eye; basal joint half of second joint and at an angle to it; second joint cylindrical and straight; terminal joint a little over half of second joint, very slender, angled a little downwards and well tufted with long scales;



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maxillary palpi two jointed, appressed to frons and loosely covered with very long scales; first joint rather narrow; second joint stouter, sub-oval; frons rounded, smoothly scaled; antennae simple; ocelli and chaetosema present; thorax, abdomen and legs smoothly scaled, in hind tibiae mixed with hairs. *Forewing*: rather broad towards tornus, where it is two-fifths length of wing; costa straight; apex well-rounded; termen oblique; tornus broadly rounded; inner margin well arched; cell three-fifths of wing; DC a little oblique outwardly, obsolescent between  $M_1$  and  $M_2$ ; Sc,  $R_1$  and  $R_2$  obsolescent near costa;  $R_1$  from beyond four-fifths of upper median;  $R_2$  very shortly stalked with stalk of  $R_3$ ,  $R_4$ ;  $R_3$  stalked with  $R_4$  for nearly half of  $R_2$ ;  $M_1$  as far from stalk as half distance  $R_1$  to stalk, DC above  $M_1$  outwardly oblique;  $M_2$  and  $M_3$  well apart but a little approximated near base;  $C_2$  as far from  $C_1$  as  $M_3$  is;  $C_2$  as far from  $C_1$  as  $M_3$  is;  $A_2$  almost straight. *Hindwing*: broad, almost semicircular, width nearly two-thirds of its length; costa straight, curving into well rounded apex; termen very oblique, arched, curving into broadly rounded tornus; inner margin well arched; cell at lower median half length of wing, shorter at upper median; DC oblique, rather weak; Sc almost straight; upper median only visible at terminal half and running very close to Sc for its basal half, touching it but nowhere fusing with it;  $M_1$  very shortly stalked with RS,  $M_2$  and  $M_3$  coincident and with  $C_1$  from a point at upper angle;  $C_2$  from six-sevenths of lower median; anal veins straight, radiating.

Besides the type, five other species are placed in the genus, all from Europe and not far from the Mediterranean.

Genus **GATEREMNA** Meyr. (Fig. 60).

*Cateremna* Meyr., Proc. Linn. Soc. New S. Wales, 7, p. 156 (1882); Rag., Rom. Mém. VIII (as a synonym of *Hyphantidium* Scott), p. 72 (1901).

Type: *Assara albicostalis* Wlk., from India = *Euzophora niveicostella* Hmps.

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**Explanation of figures 55—62.**

In all figures the wings of each species are indicated by the number; the figure behind the name indicates the enlargement of the wings; the letter *a* indicates the head, 7 times enlarged; *b* the labial palpus 16 times enlarged; *c* the maxillary palpus 24 times enlarged, unless otherwise indicated.

55. *Eccopidia strigata*, × 6, ♀. 56. *Unadilla erronea*, × 6, ♂. 57. *Plodia interpunctella*, × 5, ♀. 58. *Homoeosoma sinuella*, × 6, ♀. 59. *Asarta aethiops*, × 6, ♀. 60. *Crateremna albicostalis*, × 6, ♂. 61. *Euzophora villora*, × 3, ♀. 62. *Pempelia ornatella*, × 5, ♀; e-f ♂; f antenna, × 16.

♂, ♀. Proboscis well developed, covered with scales at basal portion; labial palpi upturned, reaching well above vertex, smoothly scaled and tapering to a fine point; basal joint curved, less than half of second joint in length; second joint curved, of even width; terminal joint over half of second joint and tapering to a fine point; maxillary palpi three-jointed, covered with rather long scales, appressed to frons; first joint narrow and smaller than second joint which has an irregular shape; terminal joint egg-shaped, as long as second joint well tufted with scales; frons rounded, smoothly scaled; ocelli minute; chaetosema present; ♂ antennae rather flattened, laminated and very shortly ciliated, lamina about diameter of shaft; antennae in ♀ simple; thorax, abdomen and legs smoothly scaled. *Forewing*: rather broad at tornus, over one-third of length; costa straight till beyond middle, then arched into rounded apex, termen slightly oblique and a little arched, tornus broadly rounded, inner margin somewhat arched; cell three-fifths of wing; DC between  $M_1$  and  $M_2$  obsolescent, slightly oblique and incurved; Sc and  $R_1$  obsolescent near costa;  $R_1$  from three-fourths of upper median,  $R_2$  shortly stalked with stalk of  $R_3$ ;  $R_3$  and  $R_4$  stalked for over two-thirds of  $R_3$ ;  $M_1$  as far from stalk as one-fifth distance of  $R_1$  and upper angle;  $M_2$  and  $M_3$  from a point;  $C_1$  from about middle of  $C_2$  and lower angle;  $C_2$  from seven-eighths of lower median;  $A_2$  almost straight. *Hindwing*: semicircular, except that termen is straight, width almost half of length; costa a little arched; apex slightly rounded; termen very oblique; tornus broadly rounded into well arched inner margin; cell about half of wing; DC weak but present, erect, incurved; upper median only visible for its terminal third; RS anastomosing just beyond its origin for nearly half its length with Sc; RS and  $M_1$  from upper angle;  $M_2$  and  $M_3$  coincident and stalked with  $C_1$  for one-fourth of  $C_1$ ;  $C_2$  from nearly four-fifths of lower median, anal veins radiating and slightly curved at basal half.

I cannot see why Hampson described *niveicostella*, which proved to be the same as Walker's *albicostalis*, as an *Euzophera* for that genus has  $M_2$  and  $M_3$  of the forewing on a well developed stalk. Ragonot again considered *Cateremna* Meyr. as a synonym of *Hyphantidium* with *sericarium* as the type and he places *albicostalis* as a distinct species foremost in that genus, but according to his description *Hyphantidium* has  $R_2$  ordinarily from cell,  $M_2$  and  $M_3$  separate in forewing and in the hindwing RS is free from Sc, while  $M_2$  and  $C_1$  are from lower angle. I do not have the genotype of *Hyphantidium* and only a few species out of the 21 placed there, so I cannot say in how far these characters are constant, but it appears to me that there are sufficient differences to keep the genus distinct. Also, the fact that this genus has representatives in the Mediterranean region, Madagascar, India, Japan, Australia and even Central America suggests that it may be a composite genus.

*Cateremna* has a limited distribution with 4 species only, all from the Indo-Malayan subregion.

Genus **EUZOPHERA** Zell. (Fig. 61).

*Euzophera* Zell., Trans. Ent. Soc. Lond. (3) V., p. 456 (1867), (n.n. for *Stenoptycha* Heineman (1866) nec Agass); Rag., Rom. Mém. VIII., p. 36 (1901); Hulst, N. Am. Lep. p. 174 (1890); Hmps. Moths of India, IV., p. 72 (1896).

Type: *Phycis pinguis* Haw. from Europe\*.

♂, ♀. Proboscis well developed, scaly at base; labial palpi upturned; reaching beyond vertex, smoothly scaled, pointed; basal joint half of second joint; terminal joint a little shorter than second joint, which is well curved and a little broader at base; maxillary palpi three jointed, appressed to frons, covered with long scales; joints of almost even length; frons rounded, smoothly scaled; ocelli and chaetosema present; ♂ and ♀ antennae simple, somewhat flattened, finely ciliated; vertex somewhat roughly scaled between antennae; thorax, abdomen and legs smoothly scaled. *Forewing*: surface on upperside smooth; greatest width one-third of length, slightly tapering towards base; costa straight, arched at terminal fourth into well rounded apex; termen erect, straight till  $C_1$ , then curved into rounded tornus; inner margin straight, incurved near base; cell two-thirds of wing; DC erect, obsolescent between  $M_1$  and  $M_2$ ; Sc and  $R_1$  obsolescent near costa;  $R_1$  from four-fifths of upper median;  $R_2$  stalked for about one-fourth with stalk of  $R_3$  and  $R_4$ .\*\*  $R_3$  and  $R_4$  on a stalk of over half of  $R_1$ ;  $M_1$  well remote from stalk;  $M_2$  and  $M_3$  on a stalk of nearly half of  $M_3$ ;  $C_1$  as far from stalk as  $M_1$  is from upper angle;  $C_2$  a little further still;  $A_2$  straight. *Hindwing*: subtrapezoidal, width over half of length; costa well arched; apex a little rounded; termen oblique, arched and merging into broadly rounded tornus; inner margin roundly lobed at  $A_1$ ; cell nearly half of wing; DC rather weak, strongly incurved, with lower DC outwardly oblique; upper median obsolescent at basal half; RS and  $M_1$  shortly stalked; RS anastomosing with Sc for nearly half its length;  $M_2$  and  $M_3$  coincident and stalked with  $C_1$  for one-third of  $C_1$ ;  $C_2$  from three-fourths of lower median; anal veins radiating.

According to the 80 species placed here, *Euzophera* would have

\* Hampson, l.c., gives *biviella* Zell. as the type, but Ragonot uses this species as the type of *Moodna* Hulst. I do not know whether one of these two species was included in *Stenoptycha* Heineman, as I have no access to this work, and Zeller just proposes a new name for the preoccupied *Stenoptycha* and then places the following new species in the renamed genus: *pilosella*, *samaritanella*, *jaustinella* and *flavirinella*. As *biviella* is used for another genus it seems advisable to use *pinguis* as the type.

\*\* In *villora* and many other species placed in this genus such as *cinerasalla*, *semifuneralis*, *ostricolorella*, *nigricantella*, *griselda*, *lunatella* and *perticella*  $R_2$  is free, sometimes remote and sometimes approximated. *E. micans* Hmps. is wrongly placed in *Euzophera* as vein  $R_2$  is coincident with  $R_3$ ; also the palpi and the genitalia are quite different; moreover  $C_1$  and  $C_2$  are well stalked. As in other genera the stalking of  $R_2$  seems to be variable and I agree with Dr. Heinrich that this character by itself cannot be relied on.



representatives all over the world, but it may be that *micans* Hmps. is not the only one placed in the wrong genus. At least 26 species are from the Mediterranean region, 12 are from more Central Europe, 8 are from India, one each are from China and Japan, 5 are from Australia, only 6 are from Africa south of the Sahara and 21 have been recorded from America, largely from the Northern portion of Central America.

Genus **PEMPELIA** Hübn. (Fig. 62).

*Pempelia* Hübn., Verz. p. 369 (1827); Rag., Rom. Mém., Lep. VIII., p. 88, pl. II., fig. 10 (1901).

Type: *Pempelia ornatella* Schiff., from Europe.

♂, ♀. Proboscis well developed, covered with scales at base; labial palpi obliquely upturned, somewhat appressed to frons, more so in ♂; in ♂ the second joint has a groove to receive the brush of the maxillary palpi, in ♀ it is solid and smoothly scaled; scales broad in ♂; first joint one-third of second joint; third in ♀ half of first joint, shorter in ♂; maxillary palpi three-jointed, basal joint long and slender; second joint in ♂ oval, in ♀ subconical; third joint oval with a short stalk in ♂ to attach it to above middle of second joint; second and third joints with a long hair-brush in ♂, with tufts of long scales in ♀; frons with a conical scale tuft; ocelli and chaetosema present; ♂ antennae with two ridges of scales in a slight sinus at base, shaft shortly ciliated, in ♀ simple; vertex, thorax, abdomen and legs smoothly scaled. *Forewing*: smooth on upperside, width at tornus one-third of length, somewhat tapering towards base; costa straight till  $R_3$ , then arched into rounded apex; termen a little oblique, straight till  $C_1$ , then curved into broadly rounded tornus; inner margin straight; cell over three-fifths of wing;  $Sc$ ,  $R_1$  and  $R_2$  obsolescent near costa;  $R_1$  from four-fifths of upper median;  $R_2$  from close to upper angle;  $R_3$  and  $R_4$  stalked for half of  $R_3$ ;  $M_1$  well remote from stalk; DC between  $M_1$  and  $M_2$  obsolescent;  $M_2$  and  $M_3$  remote at base but approximated for a short distance, then parallel;  $C_1$  twice as far from  $M_3$  as  $M_2$  is;  $C_2$  twice as far from  $C_1$  as  $C_1$  is from  $M_3$ ;  $A_2$  straight; traces of  $A_1$  present. *Hindwing*: a little more than semicircular and more roundly extended at tornus, width nearly three-fourths of length; costa arched near rounded apex; termen oblique and well arched, merging into broadly rounded tornus; inner margin with a rounded bulge at  $A_1$ ; cell one-third of wing at upper median, a little longer at lower median as lower DC is very oblique; upper DC obsolescent; lower DC weak but distinct; RS and  $M_1$  on a short stalk; free part of RS approximated to  $Sc$  and running against it for half the length of RS but not anastomosing with it;  $M_2$  and  $M_3$  coincident and stalked with  $C_1$  for one-third;  $C_2$  from nine-tenths of lower median; anal veins radiating;  $A_2$  and  $A_3$  straight,  $C_1$  curved.

Twenty three species are recorded as belonging here, most of which come from Central Europe and the Mediterranean region, one each from the Sudan, India and Australia.

Genus **PSOROSA** Zell. (Figs. 63, 64).

*Psorosa* Zell., Isis, p. 749 (1846); Rag., Rom. Mém. Lep. VIII. p. 102 (1901).

Type: *Phycis dahliella* Treit., from Europe.

♂. Proboscis well developed and with scales at basal portion; labial palpi obliquely porrect, reaching well above vertex, over three times diameter of eye, rather loosely covered with moderately long scales; basal joint about one-third of second joint; second joint cylindrical, of even width; third joint half of second joint in length and width, roundly pointed and slightly downcurved; maxillary palpi three-jointed; basal joint narrow and as long as second joint, which is subquadrate; third joint oval; the two terminal joints tufted with long scales and appressed to frons; frons with a conical scale-tuft; ocelli and chaetosema present; antennae simple, not tufted and without a sinus, hardly ciliated; vertex, thorax, abdomen and legs smoothly scaled. *Forewing*: width less than one-third of length, gradually narrowing towards base; cell two-thirds of wing; DC between  $M_1$  and  $M_2$  obsolescent, erect, incurved;  $R_1$  from six-sevenths of upper median;  $R_2$  well apart from upper angle and radiating from stalk;  $R_3$  and  $R_4$  on a stalk of over half of  $R_4$ ;  $M_1$  well remote from upper angle;  $M_2$  and  $M_3$  well apart at base, radiating for basal half, then parallel;  $C_1$  a little further from  $M_3$  than  $M_2$  is and almost parallel to  $M_3$ ;  $C_2$  twice that distance and parallel to  $C_1$ ;  $A_2$  straight. *Hindwing*: sub-trapezoidal, width three fifths of length; costa a little arched; apex rounded; termen very oblique, straight till  $C_1$ , then merging into rounded tornus; a rounded bulge at  $A_1$ ; inner margin straight; cell two-fifths of wing at upper median, over half of greatest wing-length at lower median as lower DC is very oblique; upper DC obsolescent, strongly incurved, upper median obsolescent; RS and  $M_1$  stalked for one-seventh of  $M_1$ ; stalk and half of free part of RS running along Sc, but not anastomosing with it;  $M_2$  and  $M_3$  coincident and from a point with  $C_1$  and approximated to each other for basal fourth, then radiating;  $C_2$  from four-fifths of lower median; anal veins radiating, almost straight.

Fifteen species have been recorded as belonging here but at least one (*myrmidonella*, fig. 64) does not belong here. Eight of these are from Central Europe and the Mediterranean region, two from India, one from Australia and three from America.

Of the European species I have only *dahliella*, determined by Staudinger, which I thought to be a ♀ as the antennae had no tuft or sinus and these are supposed to be there according to Ragonot's description, but it proved to be a ♂ when a genitalia preparation

was made. I also have a ♀ of *ochrifasciella* Rag. (*teste* Staudinger) and a ♂ of *opimella* Meyr. (*teste* Jeff. Turner). In this Australian species the venation of both wings is practically identical to that of the genotype, the labial palpi are a little longer, the frons has no tuft, the ♂ antennae have a sinus and tuft of scales, but the genitalia are of a totally different type. Of the Indian and American species I have no specimens.

The only African species (*myrmidonella*) placed here was described from Accra, from a ♂ in the British Museum and I have a ♂ in my collection from South Africa identified by Hampson as *myrmidonella*. In addition I have many other specimens just like it from various localities in the Union. Although Ragonot's figure of the forewing is not very good it leaves no doubt about the correct specific identification, for the curved fascia across the forewing is very distinct and characteristic and is probably responsible for placing this species next to *dahliella*. However, the hindwing of *myrmidonella* is distinctly quadrid in all my specimens, the palpi are different from those of the genotype and so are the genitalia. In our present state of knowledge of the Phycitinae I do not yet like to suggest its proper position. It shows, however, how careful we have to be in the placing of species in a genus of supposed wide distribution.

Genus **ANONAEPESTIS** Rag. (Fig. 65).

*Anonaepestis* Rag., Ind. Mus. notes, III., p. 106 (1894); Rom. Mém., Lep. VIII. p. 123 (1901); (as synonym of *Heterographis* Rag.) Hmps., Moths of India, IV. p. 68 (1896).

Type: *bengalella* Rag., from India (Calcutta).

♂, ♀. Proboscis well developed and well covered with scales at base; labial palpi upturned, reaching well above vertex, thickly covered with rather long scales; basal joint almost half of second joint, which is curved and thickest at middle; third joint over half of second joint and very slender; maxillary palpi three-jointed, appressed to frons and well tufted with long scales; basal joint slender and angled; second joint irregularly squarish; third joint ovate; frons smoothly scaled; chaetosema present, but can find no ocelli; ♂ antennae ciliated, in ♀ very shortly so; vertex, thorax, abdomen and legs smoothly scaled. *Forewing*: upper surface smoothly scaled; width almost one-third of length, costa straight for basal half, then well arched; apex slightly rounded; termen oblique, slightly arched; tornus rounded; inner margin arched at before middle; cell over three-fifths of wing; DC between  $M_1$  and  $M_2$  obsolescent, a little incurved, almost erect; Sc and  $R_1$  obsolescent near costa;  $R_1$  from well beyond two-thirds of upper median;  $R_2$  from three-fourths origin of  $R_1$  and upper angle, remote and almost parallel to stalk;  $R_3$  and  $R_4$  on a stalk of half of  $R_4$ , stalk slightly

arched towards  $R_2$ ;  $M_1$  remote from stalk for half the distance of  $R_2$  and stalk;  $M_2$  and  $M_3$  originating apart but close together and approximated to each other for a short distance;  $C_1$  almost as close to  $M_3$  as  $M_2$  is;  $C_2$  from five-sixths of lower median;  $A_3$  slightly arched at middle. *Hindwing*: subtriangular with costa arched into well rounded apex; termen very oblique and straight; tornus broadly rounded; inner margin almost straight; cell at upper median about one-fourth of wing, much longer at lower median; DC weak but well visible, incurved, outwardly oblique at lower half; upper median obsolescent; RS and  $M_1$  on a stalk of about one-fifth of RS; free part of RS running along Sc for one-third of its length, touching but nowhere fusing with Sc;  $M_2$  and  $M_3$  coincident, and as a continuation of lower DC, but stronger;  $C_1$  as a continuation of the lower median, approximated for one-third to  $M_{2,3}$  but not anastomosing with it and without a connecting vein;  $C_2$  from rather close to angle; anal veins straight and radiating.

The ♂ used for this description was identified by Hampson and the ♀ independently determined by Tams, so there can be no doubt about the correct identification; moreover both specimens agree with the descriptions, though in my specimens the costal area is more yellow, rather than greenish, as given in the figure, but green often bleaches in old specimens. Yet I find, as did Ragonot, that  $R_2$  is present and not absent as Hampson states in his "Moths of India", vol. IV, p. 70; also  $M_2$  and  $M_3$  are not stalked as is stated there. Why Hampson makes this genus a synonym of *Heterographis* is a mystery to me seeing that he thought  $R_2$  was absent. No doubt these two genera are closely related but sufficiently distinct, which they would be even more so if  $R_2$  had been really absent. The genitalia too are of a different type compared to several of the species placed in *Heterographis*. Unfortunately I do not have a ♂ of *convexella* Led., the genotype of *Heterographis*.

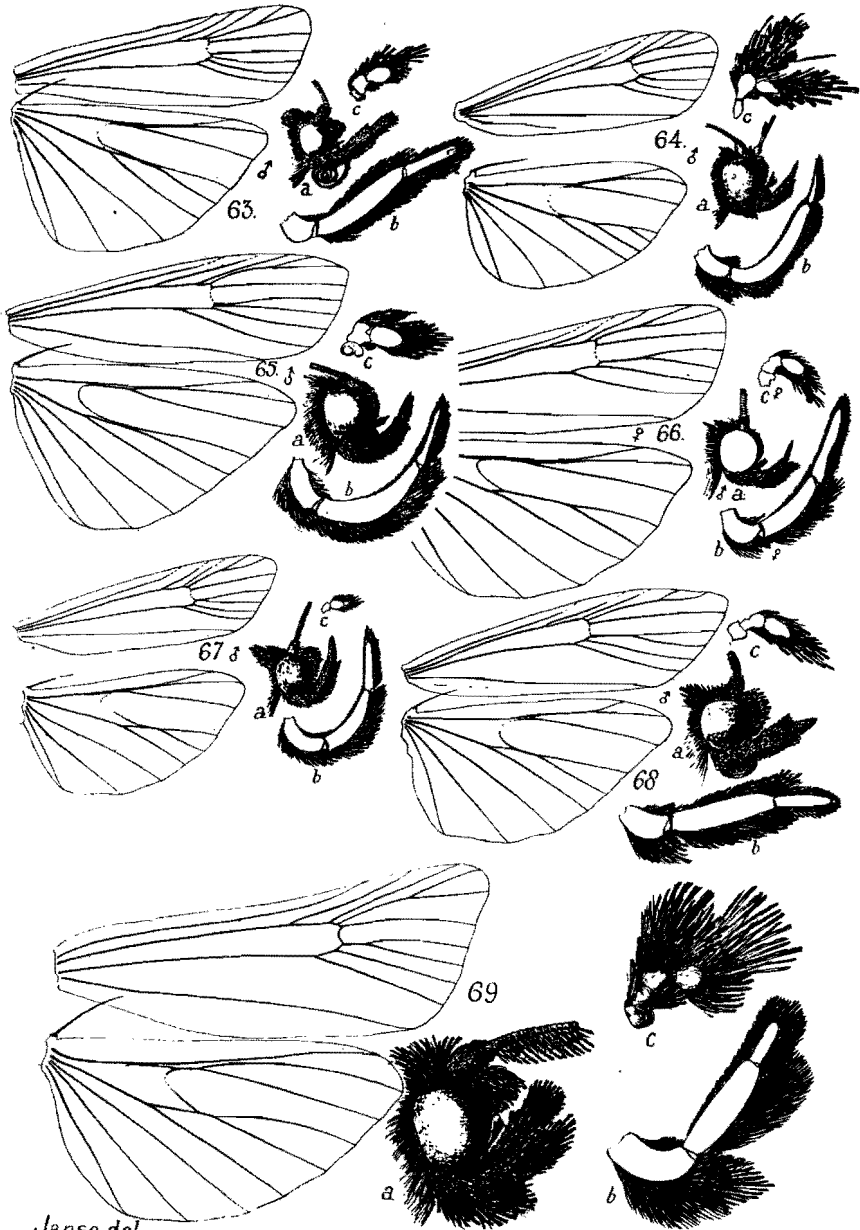
Only one species in this genus.

Genus **TRICHORACHIA** Hmps. (Fig. 66).

*Trichorachia* Hmps., A.M.N.H., v (10) p. 65 (1930).

Type *leonina* Hmps., from Sierra Leone and S. Rhodesia.

♂, ♀. Proboscis well developed and covered with scales at base; labial palpi obliquely upturned, reaching a little above vertex, rather loosely covered with scales; basal joint a little over half of second joint and with a tuft of scales; second joint with a tuft of rather long scales; third joint as long as second joint but thinner, pointed and without a tuft; maxillary palpi three-jointed, tufted with long scales and appressed to frons, basal joint short and stout; second joint longer and curved; terminal joint oval; frons rounded, smoothly scaled; ocelli and chaetosema present; antenna shortly ciliated, in ♂ without sinus or tuft; vertex and thorax somewhat



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loosely scaled; abdomen and legs smoothly scaled; hind legs shortly tufted with scales posteriorly. *Forewing*: smooth on upperside; greatest width at tornus one-third of length; costa straight, slightly arched near apex, which is rounded; termen almost erect, arched; tornus broadly rounded; inner margin slightly arched; cell over three-fifths of wing; DC between  $M_1$  and  $M_2$  obsolescent, erect, incurved; Sc and  $R_1$  obsolescent near costa;  $R_1$  from four-fifths of upper median;  $R_2$  from four-fifths of upper angle and  $R_1$  and remote from stalk;  $R_3$  and  $R_4$  on a stalk of half of  $R_3$ ;  $M_1$  nearly as far from stalk as  $R_2$  is;  $M_2$  and  $M_3$  on a stalk of one-third of  $M_2$ ;  $C_1$  as far from stalk as  $M_1$  is from upper angle;  $C_2$  over three times further from  $C_1$  than  $C_1$  is from stalk. *Hindwing*: almost semicircular, width half its length; costa almost straight and a little arched into somewhat rounded apex; termen very oblique, arched and a little incurved between the veins; tornus very broadly rounded; inner margin strongly arched; cell at upper median one-third of wing, longer at lower median as DC is very oblique and incurved at lower half; DC thin but clearly present; upper median only visible for terminal third; RS and  $M_1$  on a stalk of one-fourth of  $M_1$ ; stalk and one-third of RS approximated to Sc and for about half the distance fusing with it;  $M_2$  and  $M_3$  coincident and stalked with  $C_1$  for half its length;  $C_2$  well remote from stalk; anal veins radiating and somewhat curved.

So far, only one species has been placed in this genus which is described from Sierra Leone, but specimens of it have been captured by me in S. Rhodesia.

#### Genus **HETEROGRAPHIS** Rag. (Fig. 67)

*Heterographis* Rag., Ent. Moth. Mag. XXII. p. 31 (1885): Hmps., Moths of India IV., p. 68 (1896); Rag., Rom. Mém. VIII. p. 140, pl. ii., f. 12 (1901).

*Mona* Hulst., Ent. Am. IV., p. 115 (1888).

Type: *Myelois convexella* Led., from Asia Minor; description from ♀♀ of the genotype and from ♂ and ♀ of *H. interjectella* Rag.

♂ and ♀. Proboscis strongly developed and scaly at base; labial palpi upturned, reaching well above vertex, smoothly scaled and

#### Explanations of figures 63—69.

In all figures the wings of each species are indicated by the number; the figure behind the name indicates the enlargement of the wings; the letter *a* indicates the head, 7 times enlarged; *b* the labial palpus 16 times enlarged; *c* the maxillary palpus 24 times enlarged, unless otherwise indicated.

63. *Psorosa dahliaella*, × 5, ♂. 64. (genus) *myrmidonella*, × 5, ♂. 65. *Anonaepestis bengalella*, × 5, ♂. 66. *Trichorachia leonina*, × 5, ♀. 67. *Heterographis interjectella*, × 5, ♂. 68. *Zophodia convolutella*, × 3, ♂. 69. *Olycella pectinatella*, × 3, ♂; *b* × 11.

tapering to a point; basal joint two-thirds of second joint, curved; second joint rather slender and tapering; terminal joint more slender still and as long as basal joint, maxillary palpi three-jointed, well tufted with scales, appressed to frons, two-jointed in the genotype; both joints of the same length; basal joint more slender, second joint more curved\*; frons rounded, smoothly scaled; ocelli and chaetosema present; antennae of ♂ (according to Ragonot) almost simple, ciliated, slightly arched at base and with a small tooth in the sinus (in *interjectella* I find the ♂ antennae quite simple without a sinus and only ciliated, and so in other species placed here and represented in my collection by males, except in *H. subpyretrella* Rag. where there is a very slight sinus and a number of scale-teeth); vertex, thorax, abdomen and legs smoothly scaled. *Forewing*: smoothly scaled above; almost of even width at tornus and less than one-third of length; cell two-thirds of wing; costa slightly arched, more so towards rounded apex; termen very oblique, straight; tornus broadly rounded; inner margin straight, almost parallel to costa, suddenly upcurved to base at basal third; Sc, R<sub>1</sub> and R<sub>2</sub> obsolescent near costa; R<sub>1</sub> from six-sevenths of upper median; R<sub>2</sub> from three-fourths origin of R<sub>1</sub> and upper angle, remote from R<sub>3</sub>; R<sub>3</sub> and R<sub>4</sub> on a stalk of half of R<sub>4</sub>; M<sub>1</sub> as far from stalk as R<sub>2</sub> is; DC between M<sub>1</sub> and M<sub>2</sub> obsolescent, outwardly oblique, slightly incurved; M<sub>2</sub> and M<sub>3</sub> on a short stalk; C<sub>1</sub> as far from M<sub>3</sub> as M<sub>1</sub> is from stalk; C<sub>2</sub> a little further from C<sub>1</sub>; A<sub>2</sub> straight. *Hindwing*: almost semicircular but with a rounded bulge at A<sub>1</sub>; width half of length; costa straight, terminally well arched into broadly rounded apex; termen very oblique, strongly arched between M<sub>1</sub> and A<sub>2</sub>, merging into broadly rounded tornus; inner margin straight from near A<sub>1</sub>; cell at upper median a little over one-third of wing but over half of wing at lower median as the thin lower DC is very oblique; upper DC almost obsolescent, incurved; upper median merging into Sc for basal two-thirds, then distinct but close along Sc, almost fusing with it; RS and M<sub>1</sub> shortly stalked; RS and stalk running along Sc for one-third of its length, touching Sc everywhere but not fusing with it; M<sub>2</sub> and M<sub>3</sub> coincident, and stalked with C<sub>1</sub> for about one-fourth of C<sub>1</sub> (the length of the stalking differs in many species and it is often more than this); C<sub>2</sub> from five-sixths of lower median; anal veins radiating, almost straight.

Over one hundred species are placed in this genus and are recorded from almost every part of the world, except from Central and South America, but I doubt that these species will prove to be all placed correctly. A thorough study within the genus is essential.

\* In *interjectella* there are three joints but as the terminal joint is very small it seems likely that it is the third joint that has disappeared; here the basal joint is as long as it is broad; the second joint is ovate, and the terminal joint is subglobular and minute. In *H. sabulosella* both palpi are quite different, the labial palp has the second joint with a groove to receive the hairbrush of the maxillary palp, but in this species M<sub>2</sub> and M<sub>3</sub> are apart.

I also expect that a revision will take place among some of the species of rather wide distribution, when the genitalia of the different species are studied, for the markings on the wings often require very close scrutiny.

Genus **ZOPHODIA** Hübn. (Fig. 68).

*Zophodia* Hübn., Verz. p. 370 (1825); Rag., Rom. Mém. Lep. VIII., p. 18, pl. I., figs. 27, 28 (1901); Heinr., Proc. U.S. Nat. Mus. 86, p. 401 (1939).

Type: *Tinea convolutella* Hübn., from Europe and N. America.

♂, ♀. Proboscis strongly developed, covered with scales at base; labial palpus in ♂ oblique, straight, in ♀ more rostriform with terminal joint deflected, in both loosely covered with scales and about twice diameter of eye; basal joint half of second joint, which is of even width and straight; terminal joint half of second joint in length and thickness; maxillary palpus three-jointed, tufted with long scales, appressed to frons; first joint short, cylindrical; second joint almost twice as long but narrower and rounded at tip; terminal joint sub-oval, pointed at tip; eyes large, rounded; frons and vertex roughly scaled; ♂ antenna very shortly ciliated and with a minute scale-tuft near base but without a sinus, in ♀ simple; chaetosema present; thorax, abdomen and legs smoothly scaled. *Forewing*: smooth on upperside, narrow and tapering towards base, greatest width at tornus less than one-third of length; costa well arched at terminal half; apex roundly pointed; termen very oblique and slightly arched; tornus broadly rounded; inner margin almost straight; cell almost three-fifths of wing; Sc, R<sub>1</sub> and R<sub>2</sub> near costa and DC between M<sub>1</sub> and M<sub>2</sub> obsolescent; R<sub>1</sub> from beyond three-fourths of upper median; R<sub>2</sub> and M<sub>1</sub> well remote from upper angle and at equal distance; R<sub>3</sub> and R<sub>4</sub> on a stalk of three-fourths of R<sub>3</sub>; M<sub>2</sub> and M<sub>3</sub> on a stalk of one-third of M<sub>2</sub>; C<sub>2</sub> from nine-tenths of lower median; C<sub>1</sub> from beyond middle of C<sub>2</sub> and stalk; A<sub>2</sub> almost straight; a trace of A<sub>1</sub>. *Hindwing*: trapezoidal with a rounded bulge at A<sub>2</sub>, width over half of length; costa well arched at terminal half; apex well rounded; termen very oblique, almost straight; tornus broadly rounded; a rounded bulge at A<sub>2</sub>; cell two-fifths of wing; DC erect, strongly incurved; upper half of DC obsolescent, lower half weak; upper median coincident with Sc; RS and M<sub>1</sub> shortly stalked; RS anastomosing a little beyond stalk with Sc for almost half its length; M<sub>2</sub> and M<sub>3</sub> coincident and on a stalk with C<sub>1</sub> for one-fourth; C<sub>2</sub> from beyond three-fourths of lower median; anal veins radiating, straight.

This genus has 19 species all but one of which are from America, and one of these (the type) also occurs in Europe. The one species (*lignea*) described from Portuguese East Africa is unknown to me from specimens, but I am sure that it is wrongly placed here as the venation does not agree with the type, M<sub>2</sub> and M<sub>3</sub> of forewing



being given as separate from angle and in the hindwing  $C_1$  is given from angle, while  $M_2$  and  $M_3$  are on a long stalk, which brings it into the group which has four veins from the lower median of the hindwing. Apart from the colour no information is given about the palpi or antennae of *lignea* but it is clear that this species too has to come in the quadrifid group.

Genus **OLYCELLA** Dyar. (Fig. 69).

*Olycella* Dyar, Proc. Ent. Soc. Washington, XXX., p. 134 (1928); Heinr., Proc. U.S. Nat. Mus. 86, p. 343 (1939).

Type: *Olycella junctolineella* Hulst. Description from *O. pectinella* Hmps., prob. = *junctolineella*.

♂. Proboscis strongly developed and loosely covered with rather long scales at base; labial palpi upturned, reaching a little beyond vertex, loosely covered with long scales which form a tuft anteriorly on first and second joint; basal joint two-thirds of second joint and curved; second joint cylindrical, widest at middle; terminal joint almost half of second joint and half its thickness, roundly pointed and well tufted with scales; maxillary palpi three-jointed, tufted with very long spreading scales, appressed to frons; first joint longest, and angled at middle; second joint subtriangular but with rounded-off corners; third joint almost globular; frons with a scaled-tuft; eye large, rounded, flattened posteriorly; chaetosema present; antennae bipectinated; pectae four to five times shaft; vertex loosely scaled; thorax above with rather long loose scales; abdomen and legs more smoothly scaled but scales rather long. *Forewing*: smooth on upper surface, rather broad, greatest width at tornus one-third of length; costa slightly concave at middle; apex broadly rounded; termen a little oblique and somewhat incurved at middle; tornus broadly rounded; inner margin straight and almost parallel to costa for over terminal half, then curved into narrow base; cell two-thirds of wing; DC between  $M_1$  and  $M_3$  fairly strong, erect, incurved;  $R_1$  from before four-fifths of upper median;  $R_2$  from five-sixths origin of  $R_1$  and stalk and parallel to stalk and  $R_3$ ;  $R_3$  and  $R_4$  on a stalk of about half of  $R_3$ ;  $M_1$  almost as far from stalk as  $R_2$  is;  $M_2$  and  $M_3$  on a stalk of nearly one-fifth of  $M_2$ ;  $C_1$  from one-third of lower angle and  $C_2$ ;  $C_2$  from eight-ninths of lower median;  $A_2$  slightly curved. *Hindwing*: almost semicircular, width half of length; costa almost straight, arched into broadly rounded apex; termen very oblique, arched (strongly so between  $M_2$  and  $C_1$ ) into broadly rounded tornus; inner margin strongly arched between  $A_1$  and base; cell at upper angle over one-third of wing, longer at lower angle as lower DC is oblique outwardly; upper DC obsolescent; lower DC slender but visible; upper median visible for less than terminal half and close to Sc; RS and  $M_1$  on a short stalk; beyond the stalk RS approximates Sc and runs

along it for one-third of RS but does not anastomose with it;  $M_2$  and  $M_1$  coincident and shortly stalked with  $C_1$ ;  $C_2$  from beyond two-thirds of lower median, anal veins radiating, straight.

A copy of a drawing of the wing venation, kindly sent to me by Dr. Heinrich, is practically the same as my illustration which was made from a specimen from Mexico.

Three species are placed in this genus, all from the U.S. of America and Mexico. The genus comes very close to *Melitara* from which it differs in *Melitara* having the labial palpi porrect, but the venation is practically identical. The larvae of all the species of both genera feed on Cacti.

Genus **HYPORATASA** Rag. (Fig. 70).

*Hyporatasa* Rag., Rom., Mém. Lep., VIII., p. 5 (1901).

Type: *Pyralis allotriella* H.-S., from C. Europe.

♂, ♀. Proboscis very weak, only slightly covered with scales at base; labial palpi porrect with terminal half curved downwards, long, about four times diameter of eye, loosely covered with scales and in ♂ fringed with long hairs below; basal joint about one-fourth of second joint; second joint long and stout, slightly curved downwards; terminal joint one-third of second joint and very slender; maxillary palpi two-jointed, tufted with long scales and appressed to frons; joints slender; terminal joint a little longer than basal joint; eye sub-globular; frons somewhat bulging in ♂, rounded in ♀, smoothly covered with scales; ocelli and chaetosema present; antennae with scape tufted with scales; shaft biciliated, in ♂, with long cilia, over twice diameter of shaft, in ♀ short, about half of shaft; thorax and abdomen smoothly scaled but mixed with long hairs on upper side; legs smoothly scaled. *Forewing*: smooth above, rather broad, almost as broad at tornus as half the wing length; costa straight, slightly curved into rounded apex; termen arched between  $M_2$  and  $C_2$ , tornus broadly rounded; inner margin almost parallel to costa, roundly curved into base; cell four-seventh of wing; DC obsolescent between  $M_1$  and  $M_2$ ; Sc obsolescent near costa;  $R_1$  from five-sixth of upper median;  $R_2$  from two-thirds origins of  $R_1$  and stalked and parallel to  $R_1$ ;  $R_3$  and  $R_4$  on a stalk of half of  $R_4$ ;  $M_1$  as far from stalk as nearly half the distance of origins  $R_1$  and stalk, with the vein between the stalk and  $M_1$  strongly oblique outwardly;  $M_2$  as far from  $M_3$  as  $M_1$  is from stalk and also with the vein very oblique outwardly;  $C_1$  from middle of  $M_3$  and  $C_2$ ;  $C_3$  from  $\frac{2}{3}$  lower median;  $A_2$  somewhat undulating;  $A_1$  thin but clearly present. *Hindwing*: broad, semicircular from rounded apex to base, as termen, tornus and inner margin are broadly arched; costa straight for three-fourths, then broadly arched into rounded apex; cell at upper median one-third of wing but at lower median much longer, as lower DC is very oblique outwardly; upper median obsolescent.

except near its end and there, together with one-third of RS, touching Sc but not fusing with it;  $M_1$  from a point with RS; upper half of DC obsolescent, incurved, lower half of DC weak;  $M_2$  and  $M_3$  coincident and closely approximated to  $C_1$  at base, but with a distinct vein between them at base;  $C_2$  from five-sixths of lower median; anal veins radiating, slightly curved.

Only one species has been placed so far in this genus, and this is restricted to Hungary and parts of Russia. The specimens used for description were from Hungary.

Genus **DIVONA**. (Fig. 71).

*Divona* Rag., Rom. Mém. Lep., VII., p. 535 (1893).

TYPE: *ilignella* Zell., from Central Europe.

♂, ♀. Proboscis well developed and with scales at base; labial palpi obliquely upturned but with third joint directed downwardly, rather loosely covered with scales and somewhat fringed with scales below on second joint; basal joint one-third of second joint; second joint stout, thickest beyond middle; third joint almost one-third of second joint, about half of its thickness and almost at right angles to it; maxillary palpi three-jointed, appressed to frons and tufted with long scales; basal joint narrow but bulging at tip; second joint subglobular; third joint a little longer than basal joint and as slender; eye sub-oval; frons tufted with scales; ocelli and chaetosema present; antennae shortly ciliated, simple; thorax, abdomen and legs smoothly scaled. *Forewing*: smooth on upper surface, of almost even width, at tornus less than one-third length of wing; costa straight till  $R_1$ , then arched into rounded apex; termen oblique, arched; tornus broadly rounded; inner margin straight, rounded at base; cell less than two-thirds of wing; Sc,  $R_1$ ,  $R_2$  at costa and DC between  $M_1$  and  $M_2$  obsolescent;  $R_1$  from five-sixths of upper median;  $R_2$  from rather close to stalk and parallel with it;  $R_3$  and  $R_4$  on a stalk of two-thirds of  $R_2$  (a little shorter in *pretoriensis*);  $M_1$  well remote from stalk;  $M_2$  and  $M_3$  well remote at base and radiating;  $C_1$  as far from  $M_3$  as  $M_2$  is;  $C_2$  from five-sixths of lower median;  $A_2$  somewhat undulating; no trace of  $A_1$ . *Hindwing*: trapezoidal with a slight bulge at  $A_2$ , width three-fifths of length; costa straight, terminally arched into broadly rounded apex; termen oblique, straight till  $C_2$ , then merging into broadly rounded tornus; a broadly rounded bulge at  $A_1$ , then straight to base; cell two-fifths of wing-length at upper- and lower-median; DC erect, incurved and weak, but present; upper median obsolescent; RS and  $M_1$  on a stalk of one-sixths of  $M_1$ ; stalk and free third of RS approximated to Sc, touching but not anastomosing with it;  $M_2$  and  $M_3$  on a stalk of two-thirds of  $M_2$ ;  $C_1$  shortly stalked and after that shortly approximated to stalk of  $M_2$  and  $M_3$ ;  $C_2$  from five-sixths of lower median; anal veins straight, radiating.

Three species are so far placed here, two from Europe and one from S. Africa. The South African species (*pretoriensis*) comes very close to the type but in the hindwing the approximation of RS to Sc goes further, the stalk of  $M_2$  and  $M_3$  is a little shorter, but  $C_1$  is not stalked with the stalk of  $M_2$ ,  $M_3$  but runs very close to it for half the length of the stalk, touching it but nowhere anastomosing with it. The wing markings of *pretoriensis* come so close to those of the type that it could be taken for a dark variety.

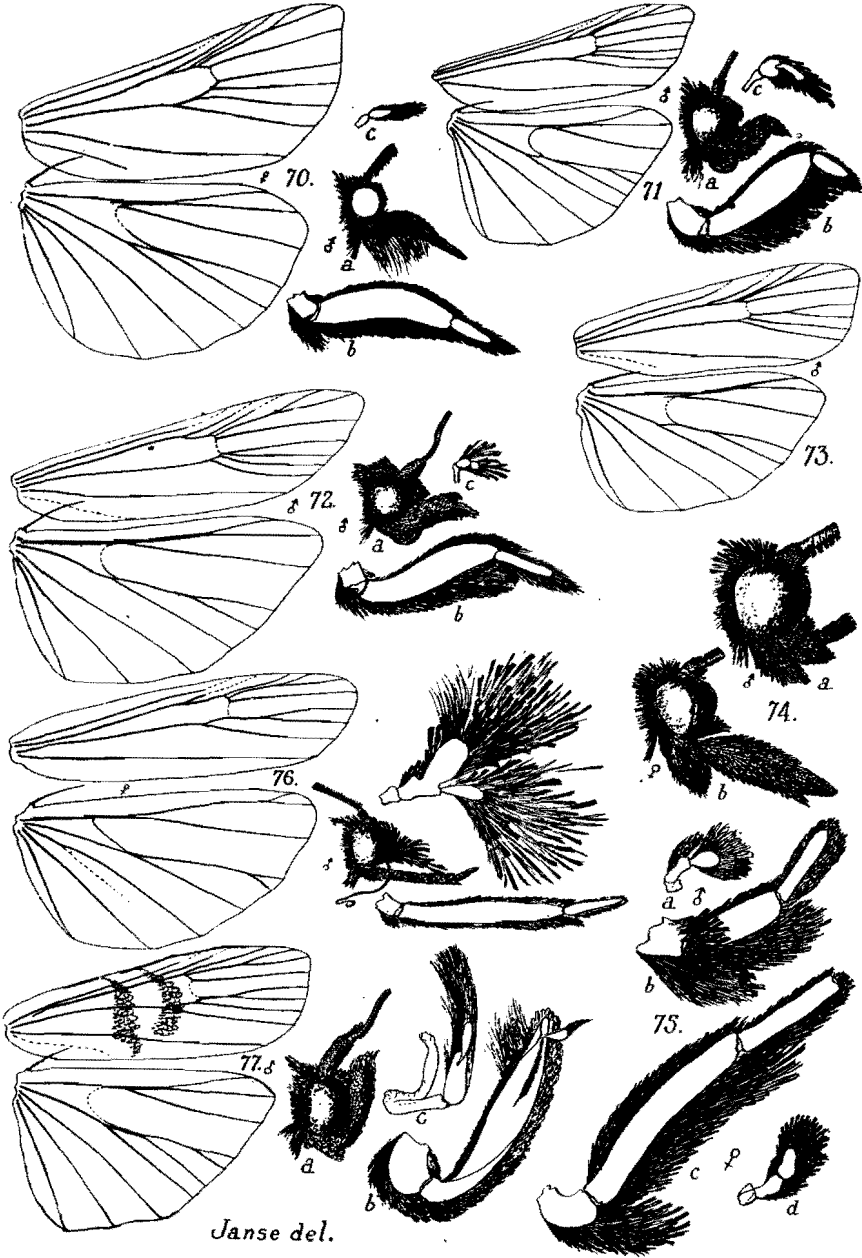
Genus **ANCYLOSIS**. (Fig. 72).

*Ancylosis* Zell., Isis, p. 178 (1839); Isis, p. 741 (1848); Rag., Rom. Mém. Lep. VIII., p. 212, pl. 1, ff. 23, 24; pl. II. f. 15 (1901).

Type: *Phycis cinnamomella*, Dup., from Europe.

♂, ♀. Proboscis well developed and scaly at base; labial palpi rostriform, nearly three times diameter of eye, loosely covered with scales; basal joint about one-third of second joint; second joint stout, somewhat undulated; third joint less than half of second joint and very slender, well hidden in scales; maxillary palpi three-jointed, loosely covered and tufted with long scales, appressed to frons; first joint slender, cylindrical; second joint a little shorter, ovate and at right angles to first joint; third joint half of second joint, oval; eye large, rounded; frons with a slight smooth scale-tuft; ocelli and chaetosema present; antenna very shortly ciliated, in ♂ with a very slight sinus at base but without a scale-tuft; vertex, thorax, abdomen and legs smoothly scaled. *Forewing*: smooth on upper side, of almost even width, which is less than one-third of its length; costa very gently arched towards rounded apex; termen very oblique, tornus broadly rounded, inner margin arched into apex; cell less than two-thirds of wing; Sc,  $R_1$  and  $R_2$  near costa and DC between  $M_1$  and  $M_2$  obsolescent; DC almost erect, incurved (a little more oblique in *capensis*);  $R_1$  from five-sixths of upper median;  $R_2$  from three-fourths origin of  $R_1$  and stalk;  $R_3$  and  $R_4$  on a stalk of half of  $R_3$ ;  $M_1$  a little nearer to stalk than  $R_2$  is;  $M_2$  and  $M_3$  from a point or very shortly stalked;  $C_1$  as far from  $M_3$  as  $M_1$  is from stalk;  $C_2$  twice that distance;  $A_2$  almost straight; traces of  $A_1$ . *Hindwing*: subtrapezoidal, as wide as half its length; costa with terminal half arched into well rounded apex; termen very oblique, merging into broadly rounded apex; a rounded bulge at  $A_1$ ; cell one-third of wing at upper median, a little longer at lower median; upper median very thin and running close to Sc; DC incurved, obsolescent at upper half; RS and  $M_1$  shortly stalked, stalk and half of RS running closely along Sc, but nowhere fusing with it;  $M_2$  and  $M_3$  coincident and on a stalk with  $C_1$  for half their length;  $C_2$  from very close to lower angle (further away from angle in *A. capensis*); anal veins almost straight, radiating.

Thirty five species are placed in this genus, twenty four of.



which come from the Palaearctic region, mostly from around the Mediterranean and a few from Central Asia; only two are recorded from India and Ceylon while nine are from South Africa. Of these *artisparsella* has the terminal joint of the labial palpi in line with the second joint; in *coremata* the labial palpi are grooved to receive the hair pencil of the maxillary palpi; in *inangulella* venation and palpi are normal (but I have only seen ♀♀ of this species), also in *melanophlebia* ♂ and ♀, though here the labial palpi are more upturned than in the genotype; *perfervida* is normal and so is *rufiscripta*, but in *tetroplagella* Sc and RS fused at one spot; in *stenozona* veins and palpi are normal. The ♂ genitalia show this to be a compact group with hardly any difference between the different species even in *coremata*, where only the ninth sternite is broader than in the other species.

Genus **CACTOBLASTIS** Rag. (Figs. 73—75).

*Cactoblastis* Rag., Rom. Mém. Lep., VIII. p. 15 (1901); Dyar, Proc. Ent. Soc. Wash. XXX., p. 135 (1928); Heinrich, Proc. U.S. Nat. Mus. 86, p. 354 (1939).

Type: *Zophodia cactorum* Berg, from South America.

♂, ♀. Proboscis weak; labial palpi in ♂ oblique, about  $1\frac{1}{2}$  times of eye, fringed with scale tufts on first and second joint, third joint blunt at tip; in ♀ palpi porrect or even drooping and almost three times diameter of eye, roughly scaled, with a scale tuft at basal joint, and shorter one on second joint; terminal joint pointedly scaled; in ♂ basal joint well over half of second joint; third joint as long as second joint but half its thickness, roundly pointed; in ♀ basal joint one-fourth of second joint which is down-curved at middle; terminal joint half of second joint and only a little thinner, roundly pointed; maxillary palpi not appressed to frons but directed outwardly, in both sexes broadly fringed with spreading scales and three-jointed; basal joint angled at middle; second joint short and subglobular, seeming fused with basal joint, tufted with a moderate tuft; terminal joint sub-oval, broadly tufted with long scales; eye large, rounded; frons and vertex roughly scaled; ocelli and chae-

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**Explanation of figures 70—77.**

In all figures the wings of each species are indicated by the number; the figure behind the name indicates the enlargement of the wings; the letter *a* indicates the head, 7 times enlarged; *b* the labial palpus 16 times enlarged; *c* the maxillary palpus 24 times enlarged, unless otherwise indicated.

70. *Hyporatasia allotriella*, × 3, ♂. 71. *Divona ilignella*, × 3, ♂. 72. *Ancylosis cinnamomella*, × 5, ♂. 73—75. *Cactoblastis cactorum*; 73, × 6, ♂; 74, × 7; 75, × 16. 76. *Pogonotropha wahlbergi*, × 5, ♀. 77. *Eulophota caustella*, × 5, ♂.

tosema present; ♂ antennae simple, shortly ciliated; in ♀ cilia very short; thorax rather roughly covered with broad scales; abdomen and legs smoothly scaled; a small scale tuft at base of abdomen. *Forewing*: upperside smoothly scaled; of almost even width in ♂, a little broader at tornus in ♀; width in ♂ one-third of its length; costa terminally arched into rounded apex; termen straight, a little oblique; tornus broadly rounded; inner margin suddenly narrowing towards base at basal third; cell three-fifths of wing; Sc and R<sub>1</sub> near costa and DC between M<sub>1</sub> and M<sub>2</sub> obsolescent; R<sub>1</sub> from before four-fifth of upper median; R<sub>2</sub> from close to upper angle but still apart; R<sub>3</sub> and R<sub>4</sub> on a stalk of half of R<sub>4</sub>; stalk approximated to R<sub>2</sub>; M<sub>1</sub> further from angle than R<sub>2</sub> is; M<sub>2</sub> and M<sub>3</sub> on a stalk of one-third of M<sub>2</sub>; C<sub>1</sub> as far from stalk as M<sub>1</sub> is from upper angle; C<sub>2</sub> nearly twice as far; A<sub>2</sub> straight, traces of A<sub>1</sub>. *Hindwing*: subtrapezoidal, width well over half of length; costa terminally broadly rounded into rounded apex; termen very oblique, arched at middle and merging into rounded tornus; a broad rounded bulge at A<sub>1</sub>, termen then arched; cell over one-third of wing length; upper median obsolescent except near angle; DC incurved, upper half obsolescent; RS and M<sub>1</sub> very shortly stalked; RS very close to Sc for half its length and even anastomosing a little beyond the stalk for a very short distance; M<sub>2</sub> and M<sub>3</sub> coincident and stalked with C<sub>1</sub> for over one-third of C<sub>1</sub>; C<sub>2</sub> from four-fifths of lower median; anal veins radiating, almost straight.

At present five species are placed here all from S. America and their larvae are all Cactus feeders. The genotype is in fact imported into Australia and South Africa in order to destroy prickly pear plants.

Genus **POGONOTROPHA**. (Fig. 76).

*Pogonotropha* Zell., Kongl. Vet. Ak. Handl. Lep. Microptera Caffr. p. 76 (1852); Rag., Rom. Mém. Lep., VIII., p. 206 (1901).

Type: *Pogonotropha wahlbergi* Zell., from South Africa.

♂, ♀. Proboscis well developed, covered with scales at base; labial palpi porrect, long, three times diameter of eye, thickly scaled, with a small tuft at end of second joint so that the terminal thin joint is clearly defined; basal joint about one-fifth of second joint, which is very long, stout at middle, tapering towards tip; terminal joint one-third of second joint, very slender and tapering to a rounded point; maxillary palpi three-jointed and tufted with very long spreading scales, directed a little outwardly; first joint very small; second joint very large, stout and with a large spreading tuft of scales joining scales of frons; third joint half the size of second joint, slender, club-shaped, originating from middle of second joint and with a spreading tuft of very long scales which reach tip of second joint of labial palpi; frons and vertex rather

loosely scaled; eye sub-oval, rounded anteriorly; chaetosema present but I can find no ocelli; ♂ antenna simple, ciliated; cilia diameter of shaft, in ♀ much shorter; thorax, abdomen and legs smoothly scaled. *Forewing*: upper surface smooth; of almost even width, narrow, a little over one-fourth of wing; costa slightly arched and broadly arched into well rounded apex; termen oblique and arched into rounded tornus; inner margin gently arched; cell less than two-thirds of wing; Sc and R<sub>1</sub> obsolescent near costa; DC obsolescent; R<sub>1</sub> from four-fifths of upper median; R<sub>2</sub> from seven-eighths of origin R<sub>1</sub> and upper angle; R<sub>3</sub> and R<sub>4</sub> on a stalk of half of R<sub>4</sub>; stalk parallel to R<sub>2</sub>; M<sub>1</sub> as far from stalk as R<sub>2</sub> is; M<sub>2</sub> and M<sub>3</sub> coincident and stalked with C<sub>1</sub> for half the length of C<sub>1</sub>; C<sub>2</sub> from seven-eighths of lower median; A<sub>2</sub> straight. *Hindwing*: almost semicircular with inner margin roundly bulging at A<sub>1</sub>, width about half of length; costa straight, terminally arching into well rounded apex; termen very oblique, strongly arched and imperceptibly merging into broadly rounded tornus; cell one-fourth of wing at upper angle as DC is very oblique; DC almost obsolescent; RS and M<sub>1</sub> very shortly stalked; RS anastomosing with Sc till near apex; M<sub>2</sub> and M<sub>3</sub> coincident and stalked with C<sub>1</sub> for four-fifths of its length; C<sub>2</sub> from lower angle; A<sub>3</sub> with indications of a branch which soon becomes a fold (this is possibly a freak development and can only be seen when a preparation is made); other anal veins normal, straight and radiating.

So far only one species has been placed in this genus, which is remarkable for its palpal development as well as for its stalking and reduction of veins.

Genus **EULOPHOTA** Hmps. (Fig. 77).

*Eulophota* Hmps., A.M.N.H. (9) 18, p. 633 (1926).

Type: *Pristarthria caustella* Hmps., from South Africa.

♂. Proboscis strongly developed and well covered with scales at basal portion; labial palpi upturned and appressed to frons, smoothly scaled and with a twisted groove along second joint; basal joint stout but only one-fourth of second joint in length; a ridge of scales in centre of groove at terminal half of second joint; the third joint is very small, sub-oval and with a narrow stalk by which it is inserted on the second joint well before tip, being placed at a right angle and tufted with long hairs; in the ♀ of *zonata* the labial palpi are the same but without the groove and the third joint is normal; maxillary palpi three-jointed; basal joint very long and slender, bent back beyond middle and curved at basal half (there is a possibility that there are here really two joints, but I can find no dividing line); second joint stout and with a long hair-pencil; terminal joint slender, club-shaped and also provided with a hair brush, both of which may be hidden between the labial palpi; eye



oval; frons and vertex rather roughly scaled; ocelli and chaetosema present; antennae with scape large and broad, smoothly scaled; shaft in ♂ with a rather long but shallow sinus and with a row of dark scales on inner side, remainder of shaft flattened and shortly ciliated; thorax, abdomen and legs smoothly scaled; thorax with two lateral scale-tufts posteriorly. *Forewing*: on upper surface two parallel transverse scale ridges, outer one at middle, inner ridge well before it; wing of almost even width, which is one-third of its length; costa gently arched beyond middle, apex rounded, termen slightly oblique, tornus broadly rounded, inner margin straight but suddenly curved into base; cell a little over three-fifths of wing at upper median, a little longer at lower median; Sc and R<sub>1</sub> near costa and DC between M<sub>1</sub> and M<sub>2</sub> obsolescent; R<sub>1</sub> from four-fifths of upper median; R<sub>2</sub> from close to upper angle; R<sub>3</sub> and R<sub>4</sub> stalked for half of R<sub>1</sub>, M<sub>1</sub> far from stalk and with connecting vein outwardly oblique; M<sub>2</sub> and M<sub>3</sub> on a stalk of one-third of M<sub>2</sub>; C<sub>1</sub> as far from stalk as M<sub>1</sub> is from upper angle; C<sub>2</sub> from four-fifths of lower median; A<sub>2</sub> almost straight; traces of A<sub>1</sub>. *Hindwing*: subtrapezoidal with a rounded bulge at A<sub>1</sub>; width a little less than two-thirds of length; costa straight, terminally arched into rounded apex; termen very oblique, almost straight into rounded tornus; inner margin arched, strongly bulging from A<sub>2</sub>; cell one-third of wing on upper median, a little longer at lower median; upper median coincident with Sc; DC with upper half obsolescent, incurved, then rather weak and close to lower median; RS and M<sub>1</sub> on a short stalk, which touches Sc; basal portion of RS beyond the stalk, touching Sc but not anastomosing with it; M<sub>2</sub> and M<sub>3</sub> on a stalk of over half of M<sub>2</sub> and as a direct continuation of DC; lower median from origin of C<sub>2</sub> approximated to lower half of DC and running very close together till they touch at lower angle from which C<sub>1</sub> originates; C<sub>2</sub> from well beyond two-thirds of lower median; anal veins radiating, almost straight.

Six species are placed in this genus, all from Southern Africa. Only two species are known to me from specimens which include *zonata*; the other four, described by de Joannis are from Makulane (Portuguese East Africa) and, judging from the description, I think they are rightly placed here. The venation, structure of ♂ palpi and the scale ridges on the forewing seem to be quite constant and suggest a compact group.